CLAIMS

What is claimed is:

1. A device for generating and projecting light marks, comprising a light source device (Q) for generating and radiating a primary light beam bundle (L1), collimating optics (K) for receiving the primary light beam bundle (L1) and for collimating, parallelizing and expanding the primary light beam bundle (L1) into a secondary light beam bundle (L2) and for radiating the secondary light beam bundle (L2) in a directed manner, and projection optics (P) for receiving at least a portion (L2Z) of the secondary light beam bundle (L2) and converting the secondary light beam bundle (L2) into at least one of a tertiary light beam bundle (L3) and marking beam bundle (LM) for at least one light mark (ML, MP) and radiating and projecting the at least one light mark (ML, MP), wherein the projection optics (P) is acted upon by one of the secondary light beam bundle (L2) and a portion (L2Z) of the secondary light beam bundle such that a central beam bundle (L2Z) of the secondary light beam bundle (L2) can be radiated through an area (ZA) of the projection optics (P) substantially, at least one marginal beam bundle (L2R) of the secondary light beam bundle (L2) adjacent to the central beam bundle (L2Z) of the secondary light beam bundle (L2) can be radiated directly past the edge or outer surface of the area of the projection optics (P), the central beam bundle (L2Z) of the secondary light beam bundle (L2) diffused through interaction with the cylindrical lens (Z) can be projected substantially in the shape of a line as part (L3Z) of the tertiary light beam bundle (L3) or as a line mark beam bundle (LML) for a light mark (ML), and at least one marginal beam bundle (L2R) of the secondary light beam bundle (L2) can be projected substantially in one of a point and a spot as part (L3R) of the tertiary light beam bundle (L3) or as a point mark bundle (LMP) for a light mark (MP).

2. The device of claim 1, wherein the projection optics (P) have a cylindrical lens (Z), and the cylindrical lens (Z) can be acted upon by one of the secondary light beam bundle (L2) and the portion (L2Z) of the secondary light beam bundle such that a central beam bundle (L2Z) of the secondary light beam bundle (L2) for the light mark (ML) can be radiated substantially through a cylinder portion area (ZA) of the cylindrical lens (Z) as the area (ZA) of the projection optics (P) in the shape of a line, and at least one marginal beam bundle (L2R) of

the secondary light beam bundle (L2) adjacent to the central beam bundle (L2Z) of the secondary light beam bundle (L2) for the light mark (MP) in the shape of one of a point and a spot can be radiated directly past one of the edge and outer surface of the cylinder portion area (ZA).

3. The device of claim 1, wherein the light source device (Q) is designed for generating and radiating at least one of coherent and monochromatic light for the primary light beam bundle (L1).

4. The device of claim 1, wherein the light source device (Q) has a laser light source or is a laser light source.

5. The device of claim 1, wherein the light source device (Q) has a laser diode or an arrangement of a plurality of laser diodes or is formed by a plurality of laser diodes.

6. The device of claim 1, wherein a diaphragm device (B) is provided between the collimating optics (K) and the projection optics (P) for beam shaping with respect to the secondary light beam bundle (L2).

7. The device of claim 6, wherein the diaphragm device (B) has or is formed by a circular diaphragm or a rectangular diaphragm provided and arranged substantially concentric to the cross section of the secondary light beam bundle (L2).

8. The device of claim 1, wherein the cylindrical lens (Z) is a circular cylinder and has a given radius (R) for the circular base upon which the cylindrical lens (Z) is based and an axis of symmetry (X).

9. The device of claim 1, wherein the cylindrical lens (Z) has an optical working diameter (D) that corresponds to twice the radius (R) of the circular base upon which the cylindrical lens (Z) is based.

10. The device of claim 1, wherein the secondary light beam bundle (L2) can be formed with a substantially elliptic cross section through selection of the type and geometry of the light source device (Q), the collimating optics (K) and the relationship of the light source device (Q) and the collimating optics (K) to one another with respect to at least one of geometry and position with a semi-major axis (a) and a semi-minor axis (b).

11. The device of claim 10, wherein the semi-major axis (a) of the cross section of the secondary light beam bundle (L2) is selected and arranged to extend approximately perpendicular to the axis of symmetry (X) of the cylindrical lens (Z).

12. The device of claim 11, wherein the semi-major axis (a) of the cross section of the secondary light beam bundle (L2) corresponds to approximately 8-times the radius (R) of the cylindrical lens (Z) and 4-times the optical working diameter (D) of the cylindrical lens (Z), and the semi-minor axis (b) of the cross section of the secondary light beam bundle (L2) corresponds to approximately one of two-times the radius (R) of the cylindrical lens (Z) and one-times the working diameter of the cylindrical lens (Z).

13. The device of claim 11, comprising a circular diaphragm (B) with a radius (Rkb) corresponding to approximately 4-times the radius (R) of the cylindrical lens (Z) and approximately two-times the optical working diameter (D) of the cylindrical lens (Z), a rectangular diaphragm (B) having a first edge (c) that is perpendicular to the axis of symmetry (X) of the cylindrical lens (Z) and corresponding to approximately 3-times the radius (R) of the cylindrical lens (Z) and approximately 1.5-times the optical working diameter of the cylindrical lens (Z) and having a second edge (d) that is parallel to the axis of symmetry (X) of the cylindrical lens (Z) and is one of approximately 5-times the radius (R) of the cylindrical lens (Z) and approximately 2.5-times the optical working diameter (D) of the cylindrical lens (Z).

14. The device of claim 10, wherein the semi-major axis (a) of the cross section of the secondary light beam bundle (L2) extends parallel to the axis of symmetry (X) of the cylindrical lens (Z).

15. The device of claim 14, wherein the semi-major axis (a) of the cross section of the secondary light beam bundle (L2) is approximately 12-times the radius (R) of the cylindrical lens (Z) and approximately 6-times the optical working diameter (D) of the cylindrical lens (Z), and the semi-minor axis (b) of the cross section of the secondary light beam bundle (L2) corresponds to approximately 4-times the radius (R) of the cylindrical lens (Z) and approximately 2-times the working diameter (D) of the cylindrical lens (Z))

16. The device of claim 14, wherein a circular diaphragm (B) is provided whose radius (Rkb) corresponds to approximately 4-times or 6-times the radius (R) of the cylindrical lens (Z) and approximately 2-times or approximately 3-times the optical working diameter (D) of the cylindrical lens (Z), and wherein a rectangular diaphragm (B) having a first edge (c) is perpendicular to the axis of symmetry (X) of the cylindrical lens (Z) and corresponds to one of approximately 3-times and approximately 6-times the radius (R) of the cylindrical lens (Z) and one of approximately 1.5-times and approximately 3-times the optical working diameter (D) of the cylindrical lens (Z), and having a second edge (d) that is parallel to the axis of symmetry (X) of the cylindrical lens (Z) that corresponds to approximately 4-times the radius (R) of the cylindrical lens (Z) and approximately 2-times the optical working diameter (D) of the cylindrical lens (Z).

17. The device of claim 10, wherein the cylindrical lens (Z) is an oblique cylinder and has one of at least one base (A) and end face (A) inclined relative to the axis of symmetry (X) of the cylindrical lens (Z), one of the base (A) and end face (A) is reflected, and at least a portion of the secondary light beam bundle (L2) is reflected by on of the base (A) and end face (A) such that an external and additional light mark (Me) can be one of imaged and projected substantially as one of a point and a spot outside of the plane formed by the device (1) and the tertiary light beam bundle (L3Z, LML) for the light mark.

18. The device of claim 17, wherein one of the two bases (A) and end faces (A) of the cylindrical lens (Z) are inclined and reflected such that two external and additional light marks (Me) are one of imaged and projected substantially as one of a point and a spot.